

REMARKS

Applicant has carefully studied the outstanding Official Action. The present amendment is intended to be fully responsive to all points of rejection and is believed to place the application in condition for allowance. Favorable
5 reconsideration and allowance of the present application are hereby respectfully requested.

Claims 1 – 14 and 26 – 31 were examined. Claims 15 – 25 and 32 – 36, which belong to the group of claims that were withdrawn from consideration, have been canceled. New claims 37 – 52 have been added. Thus, claims 1 – 14, 26 –
10 31 and 37 – 52 are now in the case.

Claim 7 is objected to because the Examiner has indicated that claim 7 recites “opposite directions” but does not clearly state opposite of what direction.

Claim 7 has been amended to recite that the second subset of the set of nonlinear elements comprises a first nonlinear element inter-configuration
15 outputting a first output signal in a first direction, and a second nonlinear element inter-configuration outputting a second output signal in a second direction, the second direction being essentially opposite to the first direction. The amendment to claim 7 is supported, inter alia, by Fig. 1 and by the specification from the fourth paragraph on page 27 through the first full paragraph on page 28.

20 Claim 28 is objected to because the Examiner has indicated that the recitation “the step of programmably selecting” has an insufficient antecedent basis.

Claim 28 has been amended to delete the words “the step of” thereby resolving the antecedent basis objection.

Claim 27 has also been amended to delete the words “the step of”,
25 similarly to claim 28.

Claims 1 – 14 and 26 – 31 stand rejected under 35 USC 103(a) as being unpatentable over US Patent 5,247,594 to Okuno et al (Okuno) and further in view of US Patent 5,737,102 to Asher (Asher).

Okuno describes a waveguide-type optical matrix switch which
30 includes as its switching element a Mach-Zehnder interferometer which includes two directional couplers and an optical phase shifter.

Asher describes methods for making a nonlinear optical device and related devices.

In rejecting claims 1, 3, 9, 26 and 27 the Examiner takes the position that Okuno discloses all the features of claims 1, 3, 9, 26 and 27 except for nonlinear
5 elements, and that a nonlinear switch is disclosed in Asher.

It is respectfully submitted that Examiner's position is incorrect. Okuno only refers to optical switching and the scope of Okuno is optical switching. Okuno does not at all show or suggest optical processing configurations and/or optical processing. The example mentioned by the Examiner with respect to Fig. 1 in
10 Okuno clearly indicates that when the switches S03, S02, S01, S10, S20 and S30 are OFF and the switch S00 is ON only a switching operation occurs in which an optical signal is switched from the optical path 1a to the selected optical path 2a without any optical processing. Any other arrangement of the states of the switches in Okuno only enables to select another optical path but does not enable an optical processing
15 configuration as recited in the present invention.

Additionally, it is respectfully submitted that Examiner's position regarding a motivation for combining Okuno and Asher being achieving optimum switching efficiency is also incorrect. Combining Okuno with Asher does not provide an optimum switching efficiency, and neither Okuno nor Asher shows or
20 suggests that such a combination is expected to result in or is required for an optimum switching efficiency. For example, neither Okuno nor Asher shows or suggests any characteristic or parameter which affects switching efficiency that could have been optimized by a combination of Okuno with Asher.

In fact, there is no motivation to combine Okuno with Asher. Okuno
25 makes no use of optical processing, and Okuno also does not show or suggest a need for optical processing configurations and/or optical processing in order for the optical matrix switch described therein to properly function. Asher does not show or suggest any deficiency of the filter devices described therein that would have required a combination with Okuno. Accordingly, there could be no motivation to
30 combine Okuno with Asher.

Additionally, even if, for the sake of argument only, a person skilled

in the art would have been motivated to combine Okuno with Asher for achieving optimum switching efficiency, such an optimum would have been related to switching and would have nothing to do with optical processing configurations as recited in the present invention.

5 It is further respectfully submitted that it is not clear whether and how a combination of Okuno with Asher would at all be operative particularly since Okuno operates in a mode of operation which uses “cross” and “bar” states (see, for example, Okuno col. 5, lines 45 – 66 and col. 11, lines 18 – 59) whereas the filter devices of Asher filter by wavelength or intensity (see, for example, Asher col. 4,
10 lines 5 – 25). It is not clear whether and how the filter devices of Asher can be integrated in the optical matrix switch of Okuno and operate in the mode of operation of Okuno.

 The combination of Okuno with Asher is therefore inappropriate and a person skilled in the art is not expected to combine Okuno with Asher.

15 Thus, Applicant respectfully points out that the Examiner has failed to make a *prima facie* case for the unpatentability of any of claims 1, 3, 9, 26 and 27.

 Accordingly, claims 1, 3, 9, 26 and 27 are deemed allowable.

 Claims 2, 4 – 8, 10 and 11 depend directly or indirectly from claim 1 and recite additional patentable subject matter.

20 Claims 2, 4 – 8, 10 and 11 are therefore deemed allowable.

 Claims 28 and 29 depend from claim 26 and recite additional patentable subject matter.

 Claims 28 and 29 are therefore deemed allowable.

 In rejecting claims 12, 14 and 30 the Examiner takes the position that
25 Okuno and Asher teach the claimed invention including changing the various switch states to change the output ports.

 The arguments submitted above with respect to the patentability of claims 1, 3, 9, 26 and 27 also apply to claims 12, 14 and 30.

 Claims 12, 14 and 30 are therefore deemed allowable.

30 Claim 13 depends from claim 12 and recites additional patentable subject matter.

Claim 13 is therefore deemed allowable.

Claim 31 depends from claim 30 and recites additional patentable subject matter.

Claim 31 is therefore deemed allowable.

5 New claims 37 – 52 have been added. New claims 37 – 52 are directed to the invention elected for examination.

New claim 37 is supported by the specification and drawings as claim 1.

10 The arguments submitted above with respect to the patentability of claims 1, 3, 9, 26 and 27 also apply to claim 37.

Claim 37 is therefore deemed allowable.

Claim 38 is supported, inter alia, by the second paragraph on page 27 of the specification.

15 Claim 39 is supported, inter alia, by the specification from the second full paragraph on page 28 through the paragraph bridging pages 28 and 29.

Claim 40 is supported, inter alia, by the first full paragraph on page 32 of the specification.

Claims 38 – 40 depend from claim 37 and recite additional patentable subject matter.

20 Claims 38 – 40 are therefore deemed allowable.

Claims 41 and 42 are supported, inter alia, by the third paragraph on page 23 of the specification.

Claim 43 is supported, inter alia, by the first full paragraph on page 24 of the specification.

25 Claims 44 and 45 are supported, inter alia, by the fifth full paragraph on page 31 of the specification.

Claim 46 is supported, inter alia, by the specification similarly to claim 38.

30 Claims 41 – 46 depend from claim 1 and recite additional patentable subject matter.

Claims 41 – 46 are therefore deemed allowable.

Claims 47 and 48 are supported, inter alia, by the second and third paragraphs on page 34 of the specification.

Claims 47 and 48 depend from claim 12 and recite additional patentable subject matter.

5 Claims 47 and 48 are therefore deemed allowable.

Claims 49 – 51 are supported, inter alia, by the paragraph bridging pages 49 and 50 of the specification.

Claim 52 is supported, inter alia, by the specification similarly to claim 40.

10 Claims 49 – 52 depend from claim 26 and recite additional patentable subject matter.

Claims 49 – 52 are therefore deemed allowable.

Applicant has also carefully studied the other prior art of record including US Patent 6,408,113 B1 to Wu et al (Wu), US Patent 6,614,582 B1 to
15 Mikkelsen et al (Mikkelsen), and US Patent 4,837,855 to Hajikano et al (Hajikano) which were not applied in rejecting the claims of the present application.

Wu describes a multi-mirror reflection optical switch structure having two fixed reflecting mirrors and a plurality of parallel positioned double-sided reflecting mirrors, each capable of being raised or lowered.

20 Mikkelsen describes an optical translator that includes an interferometer and a plurality of semiconductor optical amplifiers (SOAs) coupled to the interferometer.

Hajikano describes an optical space switch which is formed in such a manner that switch elements having two inputs and two outputs are arranged in an n
25 X n matrix form and optical signals from n input highways are switched to n output highways.

Applicant finds that Wu, Mikkelsen, and Hajikano do not affect patentability of the claims of the present application, either taken separately or in combination with any of the other prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is now in condition for allowance. Favorable reconsideration and allowance of the present application are respectfully requested.

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Respectfully submitted,

A handwritten signature in black ink, consisting of several overlapping loops and a horizontal line at the end, positioned above a solid horizontal line.

Doron HANDELMAN

Date: May 17, 2005